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**B.E. (FULL TIME) DEGREE END SEMESTER EXAMINATIONS - APRIL / MAY 2014  
MATERIALS SCIENCE AND ENGINEERING BRANCH**

**III SEMESTER - REGULATION 2008**

**ML 9204 – MATERIALS STRUCTURE AND PROPERTIES**

Time : 3 Hours

Max. Marks : 100

**ANSWER ALL QUESTIONS**

**PART – A ( 10 X 2 = 20 Marks)**

1. Define metallic bond.
2. What are the numbers of atoms in FCC unit cell?
3. Make a two dimensional sketch of edge dislocation.
4. State Gibb's phase rule.
5. Give the names of different steels.
6. Define normalising heat treatment.
7. Name two crystal structures of ceramic materials.
8. What is a cermet?
9. What is the difference between thermoplastic polymer and thermosetting polymer?
10. Define liquid crystal polymer.

**PART – B ( 5 x 16 = 80 Marks)**

11. i) Explain the mechanisms of polymerization. ( 8 )  
 ii) Give the molecular formula, properties and uses of three polymers. ( 8 )
- 12.a) Explain different bonds in materials with suitable examples. ( 8 )  
 (OR)  
 b) i) Draw the BCC unit cell and show the (110) plan in it. ( 6 )  
 ii) Draw the NaCl and diamond cubic unit cells and show the atom positions. (10)
- 13.a) Discuss with suitable figures the various crystal imperfections. ( 8 )  
 (OR)  
 b) i) State Hume Rothery rules for substitutional solid solution formation. ( 6 )  
 ii) Draw the eutectic phase diagram and label all regions in it. (10)
- 14.a) i) Give the names, properties and uses of different cast irons. (12)  
 ii) Give the factors which affect the electrical conductivity of metals. ( 4 )  
 (OR)  
 b) i) Explain the mechanism of thermal conductivity of metals. ( 8 )  
 ii) Give the composition, properties and uses of nichrome, kanthal and tungsten carbide. ( 8 )
- 15.a) i) Write short note on glass ceramics. ( 8 )  
 ii) Give the properties and applications of different ceramics. ( 8 )  
 (OR)  
 b) Explain in detail with examples, the fiber reinforced composites and particulate composites.